Physical Review C 2016 vol.94 N2

Evolution of octupole correlations in Ba 123

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Abstract

© 2016 American Physical Society.High-spin states of Ba123 have been studied via the Cd108(F19,3np)Ba123 fusion-evaporation reaction at a beam energy of 90 MeV. Several E1 transitions linking the positive-parity ν(d5/2+g7/2) band and negative-parity νh11/2 band are observed in Ba123 for the first time. Evidence for the existence of octupole correlations in Ba123 is presented based on the systematic comparisons of the B(E1)/B(E2) branching ratios and the energy displacements in odd-A Ba isotopes. The characteristics of octupole correlation in the odd-ABa123,125 are explained by the state-of-the-art multidimensionally-constrained relativistic mean-field model and cluster model based on the dinuclear system concept.

http://dx.doi.org/10.1103/PhysRevC.94.021301